BRUHATH BANGALORE MAHANAGARA PALIKE

Name of the Agency	:	**Technical Manager (West),** KRIDL, Bangalore.
Name of the Work	:	Improvements to Main road & Cross roads at Abbigere, Karekallu area, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
Estimate Cost	:	Rs.

QUALITY CONTROL REPORTS TO

Asst. Executive Engineer,
Shettyhalli Sub Division,
BBMP, Bangalore.

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Basaveshwaranagar, Bangalore – 560 079.

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CIVIL WORKS

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NABL - Accredited Laboratory as per ISO / IEC-17025 :2005

T-2377

Job No.: CTCE/BBMP/W.No.12/KRIDL/CSR-9/938e/CEMENT/2015-16 Date: 04.09.2015

TEST REPORT ON CEMENT

*** CUSTOMER**	:	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
***AGENCY**	:	**Technical Manager (West),** KRIDL, Bangalore.
***NAME OF THE WORK**	:	Improvements to Main road & Cross roads at Abbigere, Karekallu area, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
SAMPLE ID	:	Cement
SAMPLE RECEIVED ON	:	02.09.2015
PERIOD OF TESTING	:	02.09.2015 to 04.09.2015

The results of the tests conducted on the cement sample are as follows:

Sl. No	Descriptions	Test Method as per IS	Test Result	Requirements as per IS: 8112-2013
1	Standard Consistency	IS-4031 (Part -4) 1988(RA-2009)	30.00 %	-
2	a) Initial Setting Time	IS-4031 (Part -5) 1988(RA-2009)	155 Minutes	Not Less than 30 Minutes
	b) Final Setting Time	IS-4031 (Part -5) 1988(RA-2009)	470 Minutes	Not More than 600 Minutes
3	Soundness by Le Chartlier Method	IS-4031 (Part-3) 1988(RA-2009)	1 mm	Not more than 10mm

*Information is furnished by the Customer/Representative.

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⇒ The results indicated above are based on the tests carried out on the samples received in the laboratory.

⇒ Any Query regarding the report must be reported within 30 days from the date of testing.

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Job No.: CTCE/BBMP/W.No.12/KRIDL/CSR-9/938e/SAND-Gradation/2015-16 : 04.09.2015

TEST REPORT ON DETERMINATION GRADATION OF FINE AGGREGATES

*** Customer** : **Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.

*** Agency** : **Technical Manager (West),** KRIDL, Bangalore.

*** Name of Work** : Improvements to Main road & Cross roads at Abbigere, Karekallu area, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.

Technical Reference : IS : 2386 Part 1 - 1963 RA-2007

Sample ID : Fine Aggregates

Sample Received on : 02.09.2015

Date of Testing : 04.09.2015

Total Wt. of Aggregates in gms **1000**

Is Sieve Size in mm	Cumulative Weight Passing in %	Specific Limits as per IS 383-1970 (RA- 2007)			
		Zone-I	Zone-II	Zone-III	Zone-IV
10	100	100	100	100	100
4.75	96.10	90-100	90-100	90-100	95-100
2.36	80.10	60-95	75-100	85-100	95-100
1.18	57.60	30-70	55-90	75-100	90-100
600 Micron	31.70	15-34	35-59	60-79	80-100
300 Micron	16.70	5-20	8-30	12-40	15-50
150 Micron	6.90	0-10	0-10	0-10	0-15

* Information is furnished by the Customer/Representative

Remarks : This sample is under Zone-I specific limits.

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Job No.: CTCE/BBMP/W.No.12/KRIDL/CSR-9/938e/AGG/GR/2015-16 : 04.09.2015

TEST REPORT ON DETERMINATION GRADATION OF COARSE AGGREGATES

*** Customer** : **Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.

*** Agency** : **Technical Manager (West),** KRIDL, Bangalore.

*** Name of Work** : Improvements to Main road & Cross roads at Abbigere, Karekallu area, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.

Technical Reference : IS : 2386 Part 1 -1963 RA-2007

Sample ID : Coarse Aggregates (40mm)

Sample Received on : 02.09.2015

Date of Testing : 04.09.2015

Total Wt. of Aggregates in gms= **10000**

Is Sieve Size in mm	Cumulative Weight Passing in %	Specific Limits as per IS 383-1970 (RA- 2007)	
		Graded	Single Sized
80	100	100	-
63	100	-	100
40	97.50	95-100	85-100
20	39.05	30-70	0-20
10	13.90	10-35	0-5
4.75	1.90	0-5	-

* Information is furnished by the Customer/Representative

Remarks : This sample is under Graded specific limits.

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Job No.: CTCE/BBMP/W.No.12/KRIDL/CSR-9/938e/CC Solid Block/2015-16 : 08.09.2015

TEST REPORT ON SOLID CONCRETE BLOCKS

* Customer : **Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.

* Agency : **Technical Manager (West),** KRIDL, Bangalore.

* Name of the Work : Improvements to Main road & Cross roads at Abbigere, Karekallu area, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.

Sample Received on : 02.09.2015

Date of Testing : 08.09.2015

Size of Blocks : 400mm x 200mm x 200mm

Cross Sectional Area : 80000 mm^2

Technical Reference : IS: 2185 (Part 1) - 2005

No. of Blocks Tested : 08

Sl.No.	Block ID	Wt. in Kg	Failure load (KN)	Compressive strength (N/mm^2)	Requirement as per IS 2185 (Part 1) - 2005
1	Block 1	35.23	259.6	3.25	Minimum required Compressive Strength of Individual Units 3.20 N/mm^2
2	Block 2	34.65	260.2	3.25	
3	Block 3	36.20	261.1	3.26	
4	Block 4	34.25	262.1	3.28	
5	Block 5	36.23	262.3	3.28	
6	Block 6	35.62	263.4	3.29	
7	Block 7	35.22	260.5	3.26	
8	Block 8	34.85	259.3	3.24	

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Job No.: CTCE/BBMP/W.No.12/KRIDL/CSR-9/938e/CC Solid Block/2015-16 : 08.09.2015

TEST REPORT ON SOLID CONCRETE BLOCKS

* Customer : **Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.

* Agency : **Technical Manager (West),** KRIDL, Bangalore.

* Name of the Work : Improvements to Main road & Cross roads at Abbigere, Karekallu area, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.

Sample Received on : 02.09.2015

Date of Testing : 08.09.2015

Size of Blocks : 400mm x 100mm x 200mm

Cross Sectional Area : 40000 mm^2

Technical Reference : IS: 2185 (Part 1) - 2005

No. of Blocks Tested : 08

Sl.No.	Block ID	Wt. in Kg	Failure load (KN)	Compressive strength (N/mm^2)	Requirement as per IS 2185 (Part 1) - 2005
1	Block 1	17.25	128.5	3.21	Minimum required Compressive Strength of Individual Units 3.20 N/mm^2
2	Block 2	18.36	129.3	3.23	
3	Block 3	18.26	130.1	3.25	
4	Block 4	17.85	128.6	3.22	
5	Block 5	18.20	129.4	3.24	
6	Block 6	17.65	129.3	3.23	
7	Block 7	18.39	130.1	3.25	
8	Block 8	17.96	131.2	3.28	

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Job No.: CTCE/BBMP/W.No.12/KRIDL/CSR-9/938e/CUBE/2015-16 19.10.2015

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

*** Customer** : **Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.

*** Agency** : **Technical Manager (West),** KRIDL, Bangalore.

*** Name of the work** : Improvements to Main road & Cross roads at Abbigere, Karekallu area, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.

*** Sample ID** : Cement Concrete

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm^2

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

*** Grade of Concrete** : M_{20}

Compressive Strength as on : 28th day

Sample Received on : 21.09.2015

Sl.No.	* Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	21.09.2015	19.10.2015	8.156	480.5	21.36
2	21.09.2015	19.10.2015	8.298	496.3	22.06
3	21.09.2015	19.10.2015	8.306	514.6	22.87

* Information is furnished by the Customer/Representative

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19/10

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Job No.: CTCE/BBMP/W.No.12/KRIDL/CSR-9/938e/CUBE/2015-16 20.10.2015

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

*** Customer** : **Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.

*** Agency** : **Technical Manager (West),** KRIDL, Bangalore.

*** Name of the work** : Improvements to Main road & Cross roads at Abbigere, Karekallu area, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.

*** Sample ID** : Cement Concrete

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm^2

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

*** Grade of Concrete** : M_{20}

Compressive Strength as on : 28th day

Sample Received on : 22.09.2015

Sl.No.	* Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	22.09.2015	20.10.2015	8.139	475.5	21.13
2	22.09.2015	20.10.2015	8.286	496.3	22.06
3	22.09.2015	20.10.2015	8.340	519.3	23.08

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20/10

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Job No.: CTCE/BBMP/W.No.12/KRIDL/CSR-9/938e/CUBE/2015-16 21.10.2015

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

*** Customer** : **Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.

*** Agency** : **Technical Manager (West),** KRIDL, Bangalore.

*** Name of the work** : Improvements to Main road & Cross roads at Abbigere, Karekallu area, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.

*** Sample ID** : Cement Concrete

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm^2

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

*** Grade of Concrete** : M_{20}

Compressive Strength as on : 28th day

Sample Received on : 23.09.2015

Sl.No.	* Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	23.09.2015	21.10.2015	8.159	479.3	21.30
2	23.09.2015	21.10.2015	8.290	498.5	22.16
3	23.09.2015	21.10.2015	8.339	512.2	22.76

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Job No.: CTCE/BBMP/W.No.12/KRIDL/CSR-9/938e/CUBE/2015-16 22.10.2015

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

*** Customer** : **Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.

*** Agency** : **Technical Manager (West),** KRIDL, Bangalore.

*** Name of the work** : Improvements to Main road & Cross roads at Abbigere, Karekallu area, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.

*** Sample ID** : Cement Concrete

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm^2

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

*** Grade of Concrete** : M_{20}

Compressive Strength as on : 28th day

Sample Received on : 24.09.2015

Sl.No.	* Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	24.09.2015	22.10.2015	8.098	476.3	21.17
2	24.09.2015	22.10.2015	8.170	493.6	21.94
3	24.09.2015	22.10.2015	8.256	516.2	22.94

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22/10

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Job No.: CTCE/BBMP/W.No.12/KRIDL/CSR-9/938e/CUBE/2015-16 22.10.2015

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

*** Customer** : **Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.

*** Agency** : **Technical Manager (West),** KRIDL, Bangalore.

*** Name of the work** : Improvements to Main road & Cross roads at Abbigere, Karekallu area, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.

*** Sample ID** : Cement Concrete

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm^2

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

*** Grade of Concrete** : M_{20}

Compressive Strength as on : 28th day

Sample Received on : 24.09.2015

Sl.No.	* Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	24.09.2015	22.10.2015	8.267	502.1	22.32
2	24.09.2015	22.10.2015	8.342	512.2	22.76
3	24.09.2015	22.10.2015	8.410	526.3	23.39

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22/10

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Job No.: CTCE/BBMP/W.No.12/KRIDL/CSR-9/938e/Kerb stone/2015-16

28.09.2015

TEST REPORT ON CONCRETE CORE (KERB STONE)

*** Name of Customer** : **Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.

*** Name of Agency** : **Technical Manager (West),** KRIDL, Bangalore.

*** Name of work** : Improvements to Main road & Cross roads at Abbigere, Karekallu area, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.

Techinical Reference : IS:516-1959 (Reaffirmed 2008), SP-24:1983.

Sample ID : Kerb Stone

Sample Received on : 23.09.2015

Date of Testing : 28.09.2015

Sl. No.	Dia of Core D (mm)	Height of Core H (mm)	Core Wt (Kg)	Density of Core (kg / m^3)	H / D	Correction factor (Based on H/D)	Failure Load (kN)	Core Strength (N/mm^2)	Correction Factor for the Dia. (Strength of the Core x 1.08)	Corrected Cylinder Compressive Strength (N/mm^2)	Equivalent Cube Compressive Strength (N/mm^2)
1	50.00	80.00	0.393	2501.92	1.60	0.960	25.05	12.76	13.78	13.23	16.53
2	50.00	81.00	0.398	2502.47	1.62	0.965	25.65	13.06	14.11	13.61	17.02
3	50.00	82.00	0.404	2509.21	1.64	0.970	25.85	13.17	14.22	13.79	17.24

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Job No.: CTCE/BBMP/W.No.12/KRIDL/CSR-9/938e/Kerb stone/2015-16

28.09.2015

TEST REPORT ON CONCRETE CORE (KERB STONE)

* Name of Customer	:	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
* Name of Agency	:	**Technical Manager (West),** KRIDL, Bangalore.
* Name of work	:	Improvements to Main road & Cross roads at Abbigere, Karekallu area, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
Techinical Reference	:	IS:516-1959 (Reaffirmed 2008), SP-24:1983.
Sample ID	:	Kerb Stone
Sample Received on	:	23.09.2015
Date of Testing	:	28.09.2015

Sl. No.	Dia of Core D (mm)	Height of Core H (mm)	Core Wt (Kg)	Density of Core (kg / m^3)	H / D	Correction factor (Based on H/D)	Failure Load (kN)	Core Strength (N/mm^2)	Correction Factor for the Dia. (Strength of the Core x 1.08)	Corrected Cylinder Compressive Strength (N/mm^2)	Equivalent Cube Compressive Strength (N/mm^2)
1	50.00	77.00	0.380	2513.41	1.54	0.955	25.55	13.01	14.05	13.42	16.78
2	50.00	78.00	0.386	2520.36	1.56	0.960	26.00	13.24	14.30	13.73	17.16
3	50.00	79.00	0.396	2552.93	1.58	0.965	26.35	13.42	14.49	13.99	17.48

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28/9

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QUALITY CONTROL REPORTS FOR

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Job No.: CTCE/BBMP/W.No.12/KRIDL/WMM/Gradation/2015-16

08.10.2015

GRADATION FOR WMM
MORTH TABLE-400-11

Customer : **Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.

Agency : **Technical Manager (West),** KRIDL, Bangalore.

Name of Work : Improvements to Main road & Cross roads at Abbigere, Karekallu area, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.

Date of Testing : 08.10.2015

Material : WMM

Sample Location : WMM Mix Plant

Oven Dry Wt (gm): **7965**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	200	200	2.5	97.5	95-100
22.4	2745	2945	37.0	63.0	60-80
11.2	1355	4300	54.0	46.0	40-60
4.75	985	5285	66.4	33.6	25-40
2.36	1120	6405	80.4	19.6	15-30
0.600	685	7090	89.0	11.0	8-22
0.075	520	7610	95.5	4.5	0-8

Note:

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08.10.2015

Aggregate Impact Value

IS: 2386 Part IV

Client	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of the Work	Improvements to Main road & Cross roads at Abbigere, Karekallu area, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
Source / Location	WMM Plant
Type of Mix	Wet Mix macadam
Date of Testing	08.10.2015

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	386	387	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	86	87	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	300	300	
4	Aggregate Impact value = percent fines	22.28	22.48	
	100* (W_2/W_1)%			22.38

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

Note:

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Job No.: CTCE/BBMP/W.No.12/KRIDL/WMM/S-T/2015-16 08.10.2015

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of Work	Improvements to Main road & Cross roads at Abbigere, Karekallu area, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	08.10.2015

Result : Flakiness Index = **12.30%**

Elongation Index = **13.19%**

Result : Combined Flakiness & Elongation index **25.49%**

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

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QUALITY CONTROL REPORTS FOR

BITUMINOUS MACADAM

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Job No.: CTCE/BBMP/W.No.12/KRIDL/BM/Bitumen/2015-16 20.10.2015

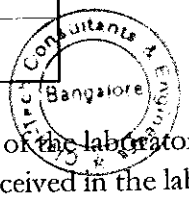
BITUMEN CONTENT DETERMINATION OF BITUMINOUS MACADAM MIX

As per IS2386 and IRC:SP:11-1984

CUSTOMER	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
AGENCY	**Technical Manager (West),** KRIDL, Bangalore.
NAME OF THE WORK	Improvements to Main road & Cross roads at Abbigere, Karekallu area, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
SAMPLE I/D	Roads in Karekallu area Abbigere, Ward No.12.
DATE OF TESTING	20.10.2015

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	483	481.5
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	17	18.50
7. Bitumen content in %	3.40	3.70
8. Average	**3.55**	



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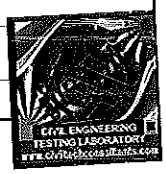
Job No.: CTCE/BBMP/W.No.12/KRIDL/BM/Bitumen/2015-16

20.10.2015

GRADATION DETERMINATION OF BITUMINOUS MACADAM MIX

As per IS2386 and IRC:SP:11-1984

CUSTOMER	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
AGENCY	**Technical Manager (West),** KRIDL, Bangalore.
NAME OF THE WORK	Improvements to Main road & Cross roads at Abbigere, Karekallu area, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
SAMPLE I/D	Roads in Karekallu area Abbigere, Ward No.12.
DATE OF TESTING	20.10.2015



GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-04 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
26.5	0	0	0	100	100
19	31.69	6.56	6.56	93.44	90-100
13.2	89.62	18.55	25.12	74.88	56-88
4.75	259.3	53.69	78.80	21.20	16-36
2.36	45.36	9.39	88.19	11.81	4-19
0.3	26.35	5.46	93.65	6.35	2-10
0.075	9.98	2.07	95.71	4.29	0-8

Þ The results indicated above are based on the tests carried	Trail 2				Specified Limits as per MORTH specification table 500-04 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
26.5	0	0	0	100	100
19	32.26	6.70	6.70	93.30	90-100
13.2	81.22	16.87	23.57	76.43	56-88
4.75	255.9	53.15	76.71	23.29	16-36
2.36	46.36	9.63	86.34	13.66	4-19
0.3	26.32	5.47	91.81	8.19	2-10
0.075	12.36	2.57	94.38	5.62	0-8

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QUALITY CONTROL REPORTS FOR

BITUMINOUS CONCRETE

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T-2377

Job No.: CTCE/BBMP/W.No.12/KRIDL/CSR-9/938e/QB(BC)/2015-16 16.10.2015

TEST REPORT ON DETERMINATION OF BITUMEN CHARACTERISTICS

***CUSTOMER**	:	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
***AGENCY**	:	**Technical Manager (West),** KRIDL, Bangalore.
***NAME OF THE WORK**	:	Improvements to Main road & Cross roads at Abbigere, Karekallu area, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
***SAMPLE ID**	:	Bitumen
DATE OF SAMPLING	:	14.10.2015
DATE OF TESTING	:	16.10.2015

The results of the tests conducted on the bitumen sample.

Sl. No	Description	Test Method as per IS	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 ^{0}C, 1/10 mm	IS :1203 -1978 (RA-2009)	68	60 to 70
2	Softening point, ^{0}C	IS :1205 -1978 (RA-2009)	46	Min. 45
3	Ductility at 27^{0}C, cm	IS :1208 -1978 (RA-2009)	100 >	Min. 50
4	Flash Point, ^{0}C	IS :1209 -1978 (RA-2009)	298	Min. 220

*Information is furnished by the Customer/Representative.

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Job No.: CTCE/BBMP/W.No.12/KRIDL/BC/AIV/2015-16

16.10.2015

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of the Work	Improvements to Main road & Cross roads at Abbigere, Karekallu area, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	16.10.2015

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	382	383	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	82	83	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	300	300	
4	Aggregate Impact value = percent fines 100* (W_2/W_1) percent	21.47	21.67	21.57

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%

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Job No.: CTCE/BBMP/W.No.12/KRIDL/BC/Shape.T/2015-16 : 17.10.2015

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	: **Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	: **Technical Manager (West),** KRIDL, Bangalore.
Name of Work	: Improvements to Main road & Cross roads at Abbigere, Karekallu area, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Bituminous Concrete
Date of Testing	: 17.10.2015

Result : Flakiness Index = **11.98%**

Elongation Index = **13.35%**

Result : Combined Flakiness & Elongation index **25.33%**

Comments:

→ Maximum allowable Flakiness & Elongation Index for Dense Graded Bituminous Macadam is 30%

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Job No.: CTCE/BBMP/W.No.12/KRIDL/BC/Stripping/2015-16

21.10.2015

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Customer	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of the Work	Improvements to Main road & Cross roads at Abbigere, Karekallu area, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
Type of Mix	Bituminous Concrete
Date of Testing	21.10.2015

Type of binder : 60/70

Percentage of binder used : 5.00% by wt.

Total weight of aggregate : 200 g

Total weight of binder : 10.00 g

Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	3.4	3.50	96.50
2	3.5		
3	3.6		

Comments:

→ Minimum allowable Aggregate retained coating for Bituminous Concrete is 95%

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Job No.: CTCE/BBMP/W.No.12/KRIDL/BC/Sp_Wa/2015-16

21.10.2015

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Customer	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of the Work	Improvements to Main road & Cross roads at Abbigere, Karekallu area, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
Type of Mix	Bituminous Concrete
Date of Testing	21.10.2015

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	1997	1998	1999	
2	Weight of basket suspended in water	W_2 g	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1239	1238	1244	
4	Weight of saturated surface dry aggregate in air	W_3 g	2022	2023	2024	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	783	785	780	
6	Weight of oven dried aggregate	W_4 g	2007	2008	2009	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.563	2.558	2.576	2.566
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.613	2.608	2.626	2.616
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.75%	0.75%	0.75%	0.75%

Comments:

→ Maximum allowable Aggregate Water absorption value for Bituminous Concrete is 2.0%

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JobNo: CTCE/BBMP/W.No.12/KRIDL/BC/Bitumen/2015-16

21.10.2015

BITUMEN CONTENT DETERMINATION OF BITUMINOUS CONCRETE MIX

As per IRC:SP:11-1984

CUSTOMER	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
AGENCY	**Technical Manager (West),** KRIDL, Bangalore.
NAME OF THE WORK	Improvements to Main road & Cross roads at Abbigere, Karekallu area, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
SAMPLE I/D	Roads in karekallu area, abbigere Ward No.12.
DATE OF TESTING	21.10.2015

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	474	473
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	26	27.00
7. Bitumen content in %	5.20	5.40
8. Average	**5.30**	

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JobNo: CTCE/BBMP/W.No.12/KRIDL/BC/Bitumen/2015-16 21.10.2015

BITUMEN CONTENT AFTER GRADATION DETERMINATION OF BITUMINOUS CONCRETE MIX

As Per IS 2386 and IRC:SP:11-1984

CUSTOMER	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
AGENCY	**Technical Manager (West),** KRIDL, Bangalore.
NAME OF THE WORK	Improvements to Main road & Cross roads at Abbigere, Karekallu area, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
SAMPLE I/D	Roads in karekallu area, abbigere Ward No.12.
DATE OF TESTING	21.10.2015

GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-18 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	36.36	7.67	7.67	92.33	79-100
9.5	35.26	7.44	15.11	84.89	70-88
4.75	65.95	13.91	29.02	70.98	53-71
2.36	69.32	14.62	43.65	56.35	42-58
1.18	53.21	11.23	54.87	45.13	34-48
0.6	64.25	13.55	68.43	31.57	26-38
0.3	51.22	10.81	79.23	20.77	18-28
0.15	33.36	7.04	86.27	13.73	12-20
0.075	36.32	7.66	93.93	6.07	4-10

Sieve Size in mm	Trail 2				Specified Limits as per MORTH specification table 500-18 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	32.65	6.90	6.90	93.10	79-100
9.5	41.22	8.71	15.62	84.38	70-88
4.75	75.65	15.99	31.61	68.39	53-71
2.36	61.22	12.94	44.55	55.45	42-58
1.18	70.28	14.86	59.41	40.59	34-48
0.6	45.36	9.59	69.00	31.00	26-38
0.3	36.25	7.66	76.67	23.33	18-28
0.15	42.32	8.95	85.61	14.39	12-20
0.075	35.65	7.54	93.15	6.85	4-10

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CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

An ISO 9001:2008 Certified Company

NABL - Accredited Laboratory as per ISO / IEC-17025 : 2005

JAS-ANZ BSCIC ISO 9001 REGISTERED

Job No.: CTCE/BBMP/W.No.12/KRIDL/BC/Agg/2015-16 21.10.2015

Aggregate Gradation Test

IS : 2386 Part I

Customer	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of theWork	Improvements to Main road & Cross roads at Abbigere, Karekallu area, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	21.10.2015

Total Weight of Sample: **5250** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	725	13.81	13.81	86.19	79 - 100	
9.5	560	10.67	24.48	75.52	70 - 88	
4.75	675	12.86	37.33	62.67	53 - 71	
2.36	445	8.48	45.81	54.19	42 - 58	
1.18	650	12.38	58.19	41.81	34 - 48	
0.600	530	10.10	68.29	31.71	26 - 38	
0.300	555	10.57	78.86	21.14	18 - 28	
0.150	425	8.10	86.95	13.05	12 - 20	
0.075	410	7.81	94.76	5.24	4 - 10	

Total Weight of Sample: **5350** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	655	12.24	12.24	87.76	79 - 100	
9.5	470	8.79	21.03	78.97	70 - 88	
4.75	635	11.87	32.90	67.10	53 - 71	
2.36	540	10.09	42.99	57.01	42 - 58	
1.18	725	13.55	56.54	43.46	34 - 48	
0.600	595	11.12	67.66	32.34	26 - 38	
0.300	465	8.69	76.36	23.64	18 - 28	
0.150	480	8.97	85.33	14.67	12 - 20	
0.075	460	8.60	93.93	6.07	4 - 10	

Note:

⇒ This test report should not be reproduced except in full, without written approval of the laboratory.

⇒ The results indicated above are based on the tests carried out on the samples received in the laboratory.

⇒ Any Query regarding the report must be reported within 30 days from the date of testing.

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VISHWANATH .C
Quality Manager

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